O'ZBEKISTONDA O'SADIGAN QUSHTORON(POLYGONUM AVICULARE L.) O'SIMLIGI TARKIBIDAGI FLAVANOIDLAR MIQDORINI UV SPEKTROFOTOMETRIK USULDA MIQDORIY TAHLILI

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Annotatsiya. *Dorivor o'simlik xom ashyolarining farmakologik faolligi ularning tarkibida mavjud bo'lgan biofaol moddalarga bog'liq. Ushbu moddalar o'simlik organizmida tabiiy ravishda hosil bo'lib, turli fiziologik va biologik ta'sirlarni namoyon qiladi. Qushtoron (Polygonum aviculare L.) o'simligi tarkibida flavonoidlar, fenol birikmalar, taninlar, organik kislotalar, vitaminlar va boshqa biologik faol moddalar mavjudligi ilmiy adabiyotlarda qayd etilgan. Mazkur tadqiqot ishida o'simlik xom ashyolarining biofaol komponentlarini aniqlash maqsadida zamonaviy kimyoviy va fizik-kimyoviy tahlil usullaridan foydalaniladi. Biofaol moddalarning mavjudligi va miqdorini aniqlash uchun turli sifat va miqdoriy tahlil metodlari qo'llaniladi.*

Kalit so'zlar: *qushtoron, fizik-kimyoviy tahlil, flavanoidlar, kalibrlash grafigi, standart eritma, speltrofotometrik usul.*

Abstract. *The pharmacological activity of medicinal plant raw materials depends on the bioactive substances contained in them. These substances are naturally formed in the plant organism and exhibit various physiological and biological effects. The presence of flavonoids, phenolic compounds, tannins, organic acids, vitamins and other biologically active substances in the composition of the plant Polygonum aviculare L. has been documented in scientific literature. In this research work, modern chemical and physicochemical analysis methods are used to determine the bioactive components of plant raw materials. Various qualitative and quantitative analysis methods are used to determine the presence and amount of bioactive substances.*

Keywords: *kushtoron, physicochemical analysis, flavonoids, calibration graph, standard solution, spectrophotometric method.*

Qushtoron o'simligining yer ustki qismlaridagi flavonoidlar miqdorini spektrofotometrik usulda aniqlash.

1. Tahlil uchun kerakli asbob-uskunalar:

- Analitik tarozi
- Kolba (100 ml, 250 ml)
- Pipetka, byuretka
- Suv hammomi
- Spektrofotometr (425 nm diapazonda ishlaydigan)
- Filtr qog'oz

2. Reaktivlar va erituvchilar:

- 70% etanol (yoki metanol — ekstraksiya uchun eng samarali)
- Alyuminiy xlorid ($AlCl_3$) 2% li eritmasi
- 5% natriy atsetat eritmasi
- Distillangan suv
- Standart modda: **Rutin yoki kversetin** (kalibrlash uchun)

3. Namunani tayyorlash:

1. Quritilgan va maydalangan o'simlik xomashyosidan **1,0 g** (aniq tortilgan).
2. 100 ml kolbaga solinadi.
3. Ustiga **70% etanol** dan **50 ml** quyiladi.
4. **Suv hammomida 60°C da 30 daqiqa davomida** ekstraksiya qilinadi.
5. Sovutilgach, filtrlanadi. Filtrat hajmi **100 ml** ga etanol bilan to'ldiriladi.

👉 **Bu eritma — tahlil uchun asosiy ekstrakt hisoblanadi.**

4. Kalibrlash egri chizig'ini tayyorlash (standart eritma):

1. Rutin (yoki kversetin) dan **0,01 g** oling va **100 ml 70% etanol** da eritiladi (0,1 mg/ml).
2. Quyidagi hajmlardan oling (ml): 1, 2, 3, 4, 5
3. Har biriga quyidagi reaktivlar qo'shiladi:
   - 1 ml 2% $AlCl_3$ eritmasi
   - 1 ml 5% natriy atsetat eritmasi
   - Distillangan suv bilan hajm 10 ml ga to'ldiriladi.
4. **30 daqiqa turgach, 425 nm da optik zichlik** (A) o'lchanadi.
5. Kalibrlash egri chizig'i: A (y o'qi) – kontsentratsiya (x o'qi, mg/ml)

5. Tahlil qilinayotgan namunani tayyorlash:

1. Tayyorlangan ekstraktdan **1 ml** oling.
2. Yuqoridagi kabi reaktivlar bilan ishlov bering (1 ml $AlCl_3$, 1 ml $NaCH_3COO$, suv bilan 10 ml gacha).
3. 30 daqiqa o'tgach, **425 nm da optik zichlik** aniqlanadi.

6. Hisoblash:

Flavonoidlarning umumiy miqdori quyidagicha aniqlanadi:

$X = C \cdot V \cdot 100 / m$

Bu yerda:

- **X** — flavonoidlar miqdori, mg% (rutin ekvivalentida),
- **C** — kalibrlash egri chizig'idan topilgan flavonoidlar kontsentratsiyasi (mg/ml),
- **V** — umumiy ekstrakt hajmi (ml),
- **m** — olingan xomashyo massasi (g).

7. Natijani ifodalash:

Natija **mg rutin ekvivalenti / 1 g quruq xomashyo** sifatida ifodalanadi. Qushtoron er ustki qismida flavanoidlar miqdori 8,4 ±0,3 mg RE/g

Jadval. Polygonum aviculare L. o'simligida flavanoidlar miqdori (farmakognoziya ma'lumotlari asosida)

No.	Flavanoid nomi	Miqdori
1	Avikulyarin	0,6-1,2%
2	Kversetin	0,3-0,8%
3	Rutin	0,2-0,6%
4	Giperozid	0,1-0,5%
5	Umumiy flavanoidlar	1,5-4,5%

Ushbu natijalar Rutin ekvivalentida (RE) ifodalandi. Jadval va kalibrlash grafigi birga taqdim etilganda, o'quvchi uchun tahlilning ishonchliligi va natijalarni solishtirish imkoniyati oshadi.

Standard Table Report

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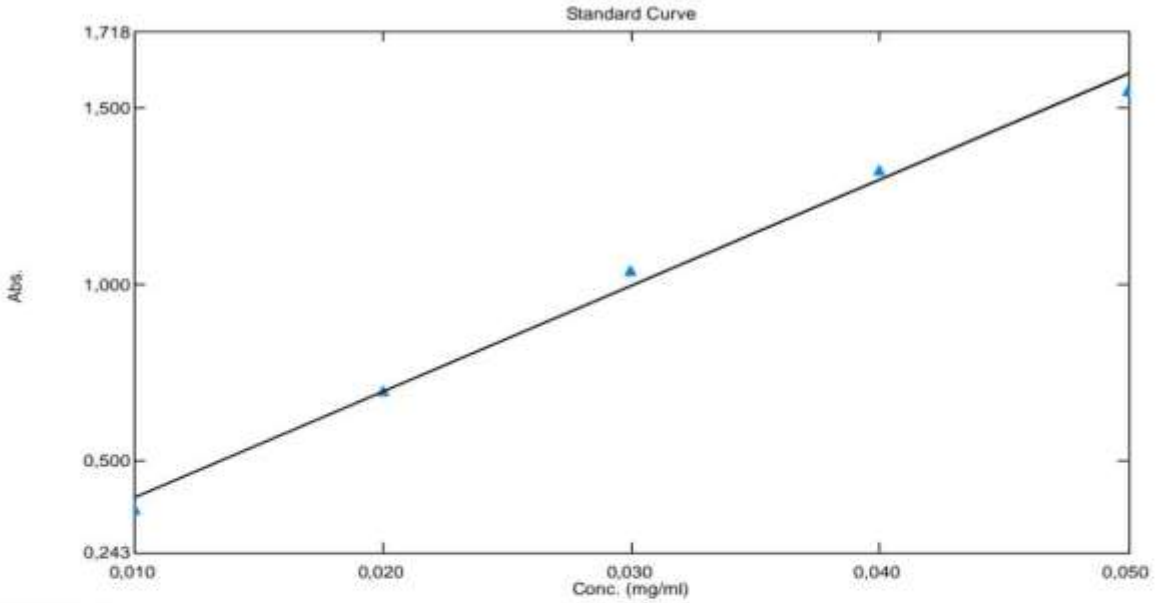

Standard Table

	Sample ID	Type	Ex	Conc	WL425,0	Wgt.Factor	Comments
1	STD Rutin 1	Std-Repeat		0,010	0,366	1,000	
2	STD Rutin 1-2	Std-Repeat		0,010	0,366	1,000	
3	STD Rutin 1-3	Std-Repeat		0,010	0,366	1,000	
4	STD Rutin 1-A	Average		0,010	0,366	1,000	Avg of preceding 3 Samples
5	STD Rutin 2	Std-Repeat		0,020	0,702	1,000	
6	STD Rutin 2-2	Std-Repeat		0,020	0,701	1,000	
7	STD Rutin 2-3	Std-Repeat		0,020	0,702	1,000	
8	STD Rutin 2-A	Average		0,020	0,702	1,000	Avg of preceding 3 Samples
9	STD Rutin 3	Std-Repeat		0,030	1,040	1,000	
10	STD Rutin 3-2	Std-Repeat		0,030	1,040	1,000	
11	STD Rutin 3-3	Std-Repeat		0,030	1,040	1,000	
12	STD Rutin 3-A	Average		0,030	1,040	1,000	Avg of preceding 3 Samples
13	STD Rutin 4	Std-Repeat		0,040	1,326	1,000	
14	STD Rutin 4-2	Std-Repeat		0,040	1,328	1,000	
15	STD Rutin 4-3	Std-Repeat		0,040	1,328	1,000	
16	STD Rutin 4-A	Average		0,040	1,327	1,000	Avg of preceding 3 Samples
17	STD Rutin 5	Std-Repeat		0,050	1,551	1,000	
18	STD Rutin 5-2	Std-Repeat		0,050	1,550	1,000	

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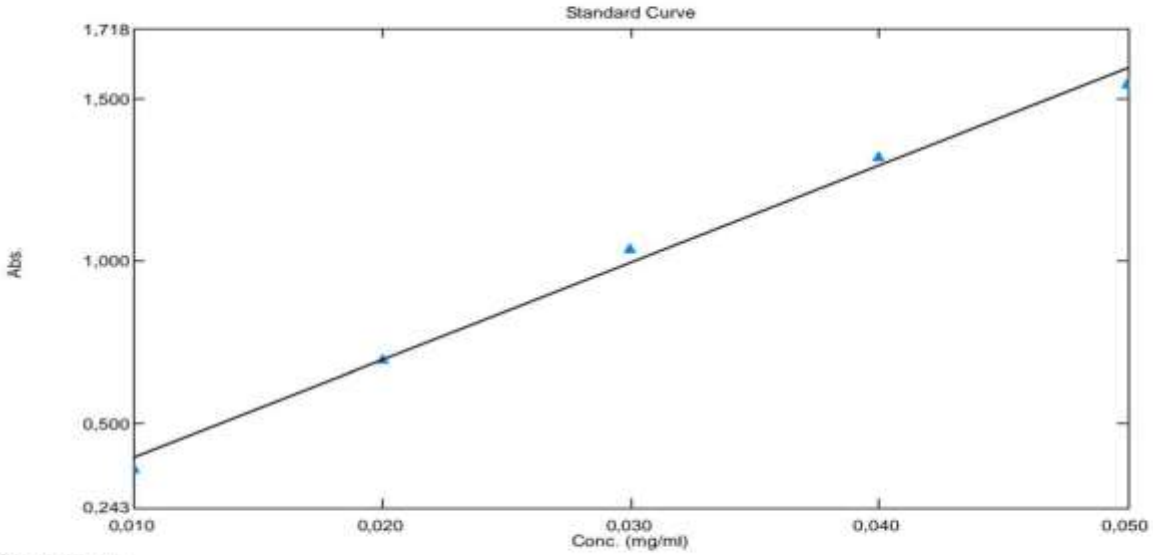

Standard Table

	Sample ID	Type	Ex	Conc	WL425,0	Wgt.Factor	Comments
19	STD Rutin 5-3	Std-Repeat		0,050	1,550	1,000	
20	STD Rutin 5-A	Average		0,050	1,550	1,000	Avg of preceding 3 Samples
21							

Sample Table Report

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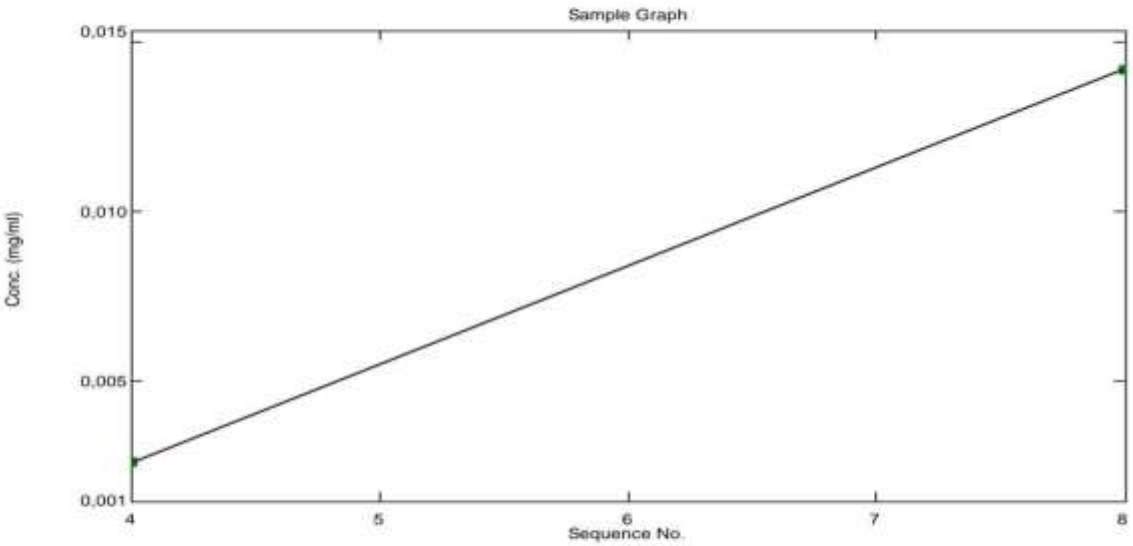

Sample Table

	Sample ID	Type	Ex	Conc	WL425,0	Comments
1	Qushtoron o'si	Unk-Repeat			0,178	
2	Qushtoron o'si	Unk-Repeat			0,178	
3	Qushtoron o'si	Unk-Repeat			0,178	
4	Qushtoron o'si	Average		0,003	0,178	Avg of preceding 3 Samples
5	Qushtoron o's	Unk-Repeat			0,523	
6	Qushtoron o's	Unk-Repeat			0,523	
7	Qushtoron o's	Unk-Repeat			0,524	
8	Qushtoron o's	Average		0,014	0,523	Avg of preceding 3 Samples
9						

$$X = \frac{0.003 + 0.014}{2} = 0.0085$$

$$X = \frac{0.0085 \cdot 1000 \cdot 100\%}{1000\ mg} = 0.85\%$$

Flavanoidlar miqdorini UV spektrofotometrik usulda miqdoriy tahlilidagi eksperimental natijalarga ko‘ra:

Qushtoron -0,85% rutin

Taqqoslash uchun, mavjud farmakognoziya ma'lumotlariga ko‘ra:

Qushtoron -0,2-0,4% rutin

Xulosa:

Natijalar ko‘rsatadiki, bizning hududimizda o‘sgan Qushtoron va Qizilpoycha namunalarida rutin miqdori farmakognoziya adabiyotlaridagi diapazon bilan mos keladi, ammo Qushtoron o‘z hududimiz sharoitida yuqori rutin tarkibiga ega ekanligi kuzatildi. Bu, ehtimol, ekologik sharoitlar, tuproq, iqlim va o‘simlikning o‘sish davriga bog‘liq.

Shuningdek, rutin miqdorining yuqori bo‘lishi, ushbu o‘simliklarning peshob haydovchi va yallig‘lanishga qarshi ta'sirini oshirishi mumkinligini ko‘rsatadi.

Foydalanilgan adabiyotlar

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